

Leaves and the Tropical Hardwood Hammocks

Which habitat video: Tropical Hardwood Hammock

Subject: Science

Duration: 2 hours or more

Group Size: 22

Setting: Classroom and outdoors

Grade: 2nd – 5th

Standards:

NGSSS - SC.2.L.17.2, SC.3.L.14.1, SC.3.L.14.2 , SC.4.L.16.2 and SC.5.E.7.5

Materials
<ul style="list-style-type: none">• Appendices A – D• Poster board• Drawing/construction paper• Crayons/Markers• Field guide/digital resource

Vocabulary: tropical, hammock, hardwood, canopy, decomposition and habitat

Objective(s):

Guiding Question: Why are leaves so important to plants?

Critical Content: Understand that the most common identifying trait of trees is the leaves; and that the decomposition of leaves is a great nutrient.

Student Objectives: Students will...

- Recognize and explain that living things are found all over Earth, but each is only able to live in habitats that meet its basic needs.
- Describe structures in plants and their roles in food production and nutrients.
- Investigate and describe how plants respond to stimuli (heat, light, gravity), such as the way plant stems grows toward light and their roots grow downward in response to gravity.
- Understand that the most common identifying trait of a tree is the leaves.
- Explain that although characteristics of plants and animals are inherited, some characteristics can be affected by the environment.
- Recognize that some of the weather-related differences, such as temperature and humidity, are found among different environments, such as swamps, deserts, and mountains.

Method

The students are going to observe plants found in their yard or neighborhood and in the school grounds. They will record their observations on a form. These observations will be shared in class. This form will be bound and made into an observation log. The students will watch a video to understand an Everglades' tropical hardwood hammock; they will research a selected tree. The class will create a collage poster board with the pictures and information. They will receive auditory information about a tree and draw/write the growth form. The activity can be extended with an observation experiment of the decaying process of leaves.

Background

A hardwood hammock is a dense stand of broad-leaved trees that grow on a natural rise of only a few inches in elevation. Hammocks can be found nestled in most all other Everglades ecosystems. In the deeper sloughs and marshes, the seasonal flow of water helps give these hammocks a distinct aerial teardrop shape. Many tropical species such as mahogany, gumbo limbo, and coco-plum grow alongside the more familiar temperate species of live oak, red maple, and hackberry. This diverse assemblage of plant life supports an equally diverse array of wildlife. Because of their slight elevation, hammocks rarely flood. Acids from decaying plants dissolve the limestone around each tree island, creating a natural moat that protects the hammock plants from fire. Shaded from the sun by the tall trees, ferns and air plants thrive in the moisture-laden air of these hammocks.

Leaves are an excellent source material for compost. The microorganisms found on leaves are sufficient to start the composting process. When placed in a compost pile in the presence of adequate moisture, leaves will decompose into an excellent organic soil that can be used as a soil conditioner; great for the

plant life within the hammock. The rate of decomposition is influenced by many factors, because decomposition is a biological process carried out primarily by bacteria and fungi, its speed will be affected by temperature and soil moisture. Decomposition is inhibited in very dry soils because bacteria and fungi dry out. Decomposition is also slow in very wet soils because anaerobic conditions develop in saturated soils. Anaerobic decomposition is less efficient than aerobic and as a result is slower. Decomposition proceeds fastest at intermediate water contents. Therefore, the moisture level within these hammocks is an important factor for the health state of this habitat.

Suggested Procedures:

Warm up

Discuss the vocabulary words hardwood, hammock, tropical, decomposition, canopy and habitat. Have students share their knowledge and experiences of trees and plants. Review the shapes of leaves and the importance of leaves in reference to the decomposition effect. Explain that leaf litter or humus layer is also a very important component of the hammocks. As the leaves and twigs decay it provides a rich source of nutrients.

Activity 1

- Have students describe and/or name trees they have seen. Locate some of the trees in a field guide and/or digital resource.
- Ask students to describe the different trees they observe in their neighborhood by taking notes.

- Provide students with the **Tropical Hardwood Hammock Leaves** (Appendix A). Use this sample chart to discuss the shapes of some trees and plants that are typical in a Hardwood Hammock in the Everglades.
- Walk through the school's grounds observing trees.
- Have each student select one leaf sample from a tree.
- Have the students complete the **Leave Observation Form** by what they have observed and inquired about the tree (Appendix B). Compile the forms and bind together to make a leave observation log.
- To demonstrate what they have learned about leaves students will share information from their leave observation form with the class.

Activity 2

Play the Tropical Hardwood Hammock video for the class located at the following web address, stopping and replaying the part of the video that discusses main idea points (time 9:31):

<http://www.nps.gov/ever/photosmultimedia/mountainsandvalleys.htm>

- Discuss the video and make a list of some of the trees, plants and animals seen.
- Students will select one plant, tree or animal to get 3 fun facts and a picture/drawing.
- All the pictures/drawings and facts will be arranged in a collage on a poster board.
- To demonstrate what they have learned about the hammock the students will be able to explain what a tropical hardwood hammock is and name 5 or more species found in a hammock to a partner.

Activity 3

- Recall information from the video about the strangler fig.
- Read aloud additional information about the strangler fig for the students to listen to; and encourage students to ask questions of the growth form of the tree (Appendix C).
- Have students share in groups what they have understood and learned about the strangler fig.
- To demonstrate what they have learned students will draw a picture or write the process of a strangler fig's growth form (Appendix D).

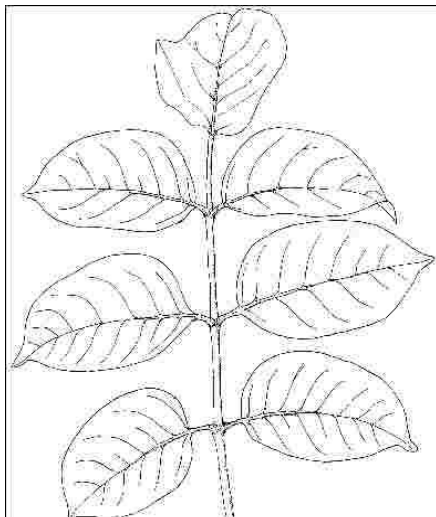
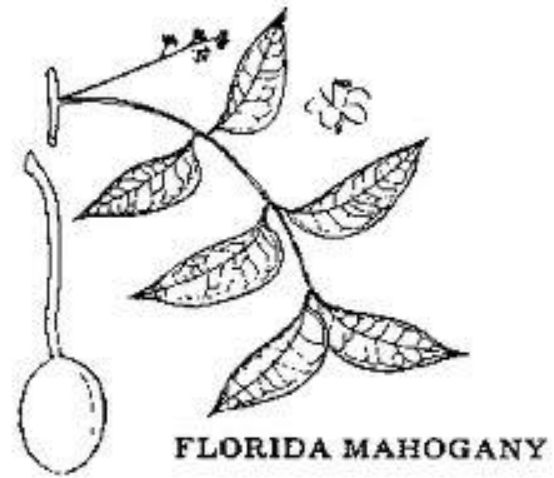
Extension:

Collect fresh leaves from one type of tree; have each student bring a certain amount of leaves (the total should be at least 32 or more). Divide the leaves and place into 4 zip logs. Date all the zip logs, same day. Place bag 1 in a dark place, no water. Place bag 2 in a dark place, with a few drops of water (only to provide some moisture). Place bag 3 where there is daylight, no water. Place bag 4 where there is daylight, with a few drops of water (use same amount of drops as bag 2). As a class write questions about the effects of light and moisture on the decaying process of a leaf. Have students make observations daily by drawing or writing what they see. Recommended 2 other trials are made.

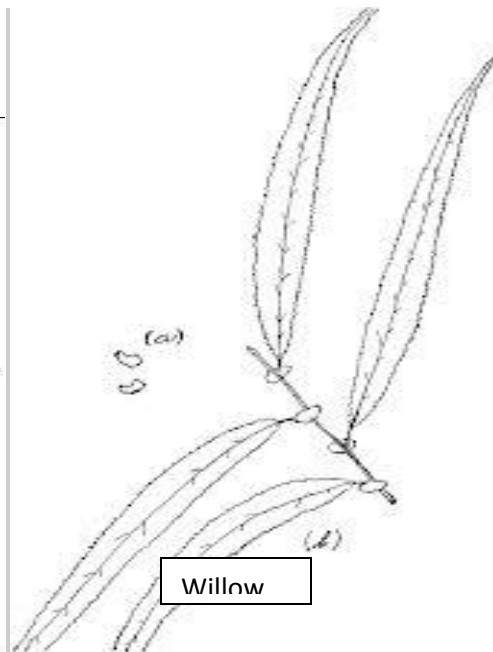
Evaluation:

Category	3	2	1
Hardwood Hammock	Clear explanation of a hammock and name five species or more that are found in them	Somewhat explanation of a hammock and name at least three species found in them	Vague explanation of a hammock and name less than three species that are found in them
Strangler Fig	Clear explanation of the growth form with accurate details	Somewhat explanation of the growth form with some details	Unable to explain the growth form with little details
Leaves	Describe a leave, name the tree and give facts about the tree	Able to do two of the following, describe the leave, name the tree and/or give facts about the tree	Able to do one of the following, describe the leave, name the tree and/or give facts about the tree

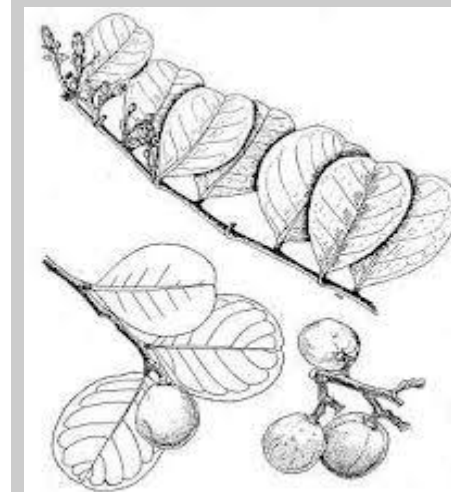
Tropical Hardwood Hammock Tree Leaves



Gumbo-Limbo



Willow



Coco-plum

Leave Observation Form

Tree Name	Tree Picture/Drawing
Where is tree located in school?	Were there any animals or other plants on or near tree?
Tree Facts	Leave Sample

Facts about the Strangler Fig

- One common hammock tree is the strangler fig.
- This species produces a berry-like fruit commonly eaten by birds.
- The seeds within the fruit are not digested and can germinate and be widely dispersed from bird droppings.
- The seed can start growing wherever there is sufficient moisture; one of the most common places is in the “head” of a cabbage palm.
- A fig seed sprouting there begins life as an epiphyte (a plant that grows on another plant)
- Like orchids, ferns, and air plants, figs are not parasites (do not take nutrients from the host tree); but the end results in the same.
- As the fig grows, the roots grow downward, toward the forest floor.
- On reaching soil, they expand greatly in size and form a network that completely entwines the host, which is eventually killed by the fig tree’s shade.
- The strangler fig literally takes the host’s place in the forest
- Strangler figs are not choosy; they even grow on stone walls, or even abandoned cars.

Strangler Fig - Growth Form

How it starts	Next	Finally

